

The Psychiatric Bulletin

FOR THE PHYSICIAN IN GENERAL PRACTICE



FALL
1956

FORCES OF THE PERSONALITY

THE

PSYCHIATRIC

BULLETIN

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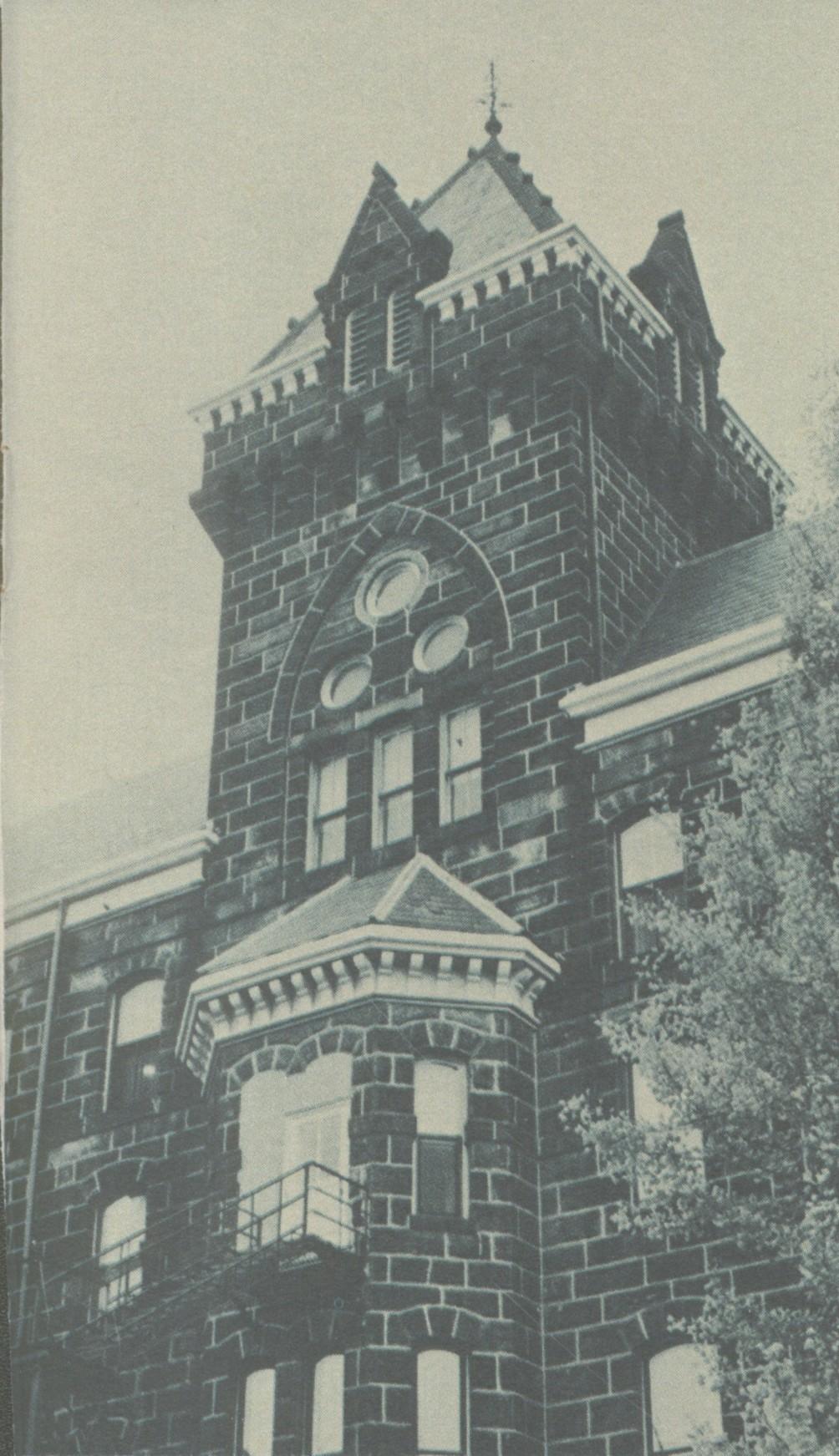
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The Cover

- According to traditional psychoanalytic theory, integration of the personality is maintained by tripartite internal government. The three often-antagonistic forces are the *id*, the *superego*, and the *ego*. The *id* represents the instinctual drives, the *ego*, the consciousness of reality or practicality, and from both of these is derived the "conscience of the unconscious" or the *superego*. A concept of these dynamics is illustrated in the cover drawing by Joseph F. Schwarting.
- A discussion of the applicability of this concept to significant human behavior begins on page 65.

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“may not have to enter hospitals”

—Pollack¹

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1. Pollack, B.: in Chlorpromazine and Mental Health, Philadelphia, Lea & Febiger, 1955.

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Volume VI - Number 4

Fall, 1956

The Psychiatric Bulletin comes to you with the compliments of Smith, Kline & French Laboratories, as part of their mental health program. Our editorial policy continues to be wholly independent and our purpose remains to keep the physician informed on new developments in psychotherapeutics for use in everyday practice.

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DRUG-INDUCED PSYCHOSES

● EXPERIMENTAL PSYCHIATRY has been hampered throughout its existence by the lack of a convenient method for the production of model psychoses and neuroses. In the past decade, however, two very ancient drugs have been intensively investigated and appear to provide some help in the solution of this problem. The first of these, mescaline, is the active principle of peyote, which has long been used by various American Indian tribes for its hallucinatory effects. The pure alkaloid was first isolated in 1898 by Heffter who also noted its ability to produce visual color hallucinations. Subsequent studies by Beringer in 1927 and de Jong in 1930 strongly suggested that mescaline produced a psychotic state resembling schizophrenia. The second of the psychosis-producing

drugs, lysergic acid diethylamide or LSD-25,® is derived from ergot, which has been responsible for epidemics of insanity throughout the world since the middle ages. The compound was first isolated in 1943 by Hoffmann, who noted while working with it that he was experiencing a peculiar restlessness and dizziness, and "a not unpleasant state of drunkenness characterized by an extremely stimulating fantasy," associated with intense kaleidoscopic color changes. Stoll confirmed these observations, and reported that even minute amounts of LSD produced a temporary psychosis. For the past ten years, the effects of these two drugs have been intensively studied in both normal and psychotic persons. They have permitted close and careful study of many of the more transient

aspects of mental disease, such as hallucinations, depersonalization and elation. Through them the investigator is permitted to develop a feeling of empathy for the over-all psychotic process, being able to observe it from its inception to its conclusion. In addition, by the study of these model psychoses it has been possible to add important new concepts to psychiatric theory. Largely as a result of studies with these drugs, a growing body of evidence has appeared which may eventually provide a physiological basis for explanation of many forms of mental disease.

Clinical studies

While mescaline must be employed at doses of from 500 to 1000 mg. in order to produce its characteristic effect, LSD is active at the extra-



dinarily low level of one *microgram* per kilogram of body weight, or less. Symptoms appear in from one-half to one and one-half hours, usually subsiding after four hours. Savage describes the changes in psychic equilibrium resulting from 10 to 100 microgram doses of LSD as consisting of hallucinations, elation, depression, anxiety, regression to autistic states, and profound ego disturbances including depersonalization and delusion formation. The maintenance of ego feeling and ego boundaries is dependant upon continuous correct perception, and LSD acts by altering this perception. Initial symptoms are sympathomimetic in nature. The pulse rate and blood pressure rise, and mydriasis and cycloplegia are present. Subjective symptoms occur, including numbness, faintness, head and

neck ache, nausea, and waves of paresthesias. Psychomotor disturbances include tremor and incoordination. A sense of omnipotence and aggrandizement may follow, but the distorted feeling of reality sometimes prevents euphoria and substitutes increasing anxiety in its place. This latter mood is characterized by a highly suspicious attitude, and an intensive struggle to retain control of the situation. Characteristically LSD provides a sensation of increased energy. The rapid flight of ideas and exaggerated sensory perception make concentration difficult. Oral and visual illusions, distortions and hallucinations become severe, and Stoll suggests that from their nature it may be concluded that LSD produces an "intoxication of the acute exogenous reaction type." Symptoms similar to

those described for LSD are also obtained with mescaline.

Of considerable interest are the results obtained with the hallucinogens in mental patients. Administration of mescaline to 55 schizophrenic patients by Pennes resulted in an intensification of the pre-existent symptoms in all of them. Thirty-nine percent showed severe reactions, thirty-two percent moderate, and twenty-nine percent only slight. With LSD, by comparison, sixty-four percent of the group studied showed intensification, twelve percent showed no reaction, and twenty-four percent gave diphasic reactions, with intensification in one area and symptom reduction in another. A number of other studies have confirmed this general variability of response.

Some insight into the mode of action of the psychosis-producing drugs may be obtained by a consideration of the substances which inhibit or reverse their activity. Denber and Merlis noted in 1954 that in patients treated with mescaline, a pronounced alteration of effects followed rapidly upon chlorpromazine injection. Within several minutes the electroencephalographic pattern reverted to pre-mescaline form, and within an hour anxiety and tension lessened or disappeared in eight of ten mental patients studied. Schwarz and Bickford found chlorpromazine similarly effective against both mescaline and LSD psychosis in a group of physicians with whom they were working. Agnew and Hoffer observed that nicotinic acid caused a clear-cut reduction of all LSD-induced disturbances except the affective ones. When the nicotinic acid was administered prior to the LSD, however, there was a reduction in disturbances in concentration and vision, but not in other symptoms, causing the authors to remark that the resultant psychosis more closely resembled schizophrenia than that produced by LSD alone. Fabling found that Frenquel,® a new nonhypnotic drug employed in the treatment of certain excited mental states, blocked the psychic effects of LSD, but not the visceral symptoms. Rinaldi and Himwich observed that both mescaline and LSD produced similar aberrations in the electroencephalograms of rabbits, but that Frenquel consistently restored the normal patterns in from two to ten minutes. Frenquel alone had no effect on the normal EEG pattern, but the dosage required to reverse the EEG pattern of the hallucinogens was directly related to the amount of the latter that had been administered. Di-isopropylfluorophosphate (DFP), amphetamine and Meratran® produce electroencephalographic changes similar to those observed with LSD and mescaline, but these EEG changes are not reversed by Frenquel.

Mode of action

The search for insight into the pharmacological mechanism of action of LSD and mescaline has resulted in some unique observations concerning cortical function. The low dosage

levels at which LSD is effective suggest that its activity is concerned with the inhibition of some enzyme system, and the previously mentioned clinical antagonism by other drugs strengthens this. Two other relatively unexplored drugs, harmine and ibogaine, also have hallucinogenic effects, and are chemically similar to LSD and mescaline in that they con-



tain an indole nucleus. (It is of interest that reserpine also contains such a nucleus.) The psychological disturbances which result from the administration of decomposed adrenaline solutions may also be related, in that the deterioration products, adrenochrome and adrenoxine, also have such a nucleus. The recent discovery in brain and other tissues of a naturally-occurring indole derivative, serotonin, has given some promise of linking these observations together. Serotonin has many of the properties of a neuro-humor, and is believed by many workers to mediate important functional activities in the central nervous system. Its pharmacological action is antagonized by LSD, and by ergotamine and yohimbine, two other indole-containing drugs of natural origin.

In view of these considerations, Woolley and Shaw have proposed that the mental disorders produced by LSD and other hallucinogens may be the result of a blocked enzyme system which results in a serotonin deficiency. Schizophrenia might then be pictured as a metabolic disorder in

which serotonin deficiency is the critical defect. Administration of serotonin to schizophrenic patients, however, has been without beneficial effect. Marrazzi and Hart, on the basis of study of nerve impulse transmission across the neural junctions of cat brain, found serotonin to have a potent adrenergic effect, 25 to 30 times that of adrenaline, and six to eight times that of LSD. They concluded that an excess of serotonin, rather than a deficiency, might more likely be responsible for mental disorders by the creation of an imbalance between cholinergic excitation and adrenergic inhibition in susceptible cerebral neural junctions. The hallucinogens would thus be stimulatory, bringing about a depression of the usual restraining influences through synaptic inhibition. While the resolution of these divergent points of view must await further research, it seems apparent that this general area of investigation is rapidly narrowing down a major organic factor in mental disease. Summing up much of the available evidence regarding LSD-induced psychosis, an American Psychiatric Association panel recently stated, "The psychotic state produced by lysergic acid diethylamide was felt to be not identical with that found in schizophrenia but there were sufficient similarities to suggest that a biochemical factor is involved in schizophrenia."

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DEFENSE MECHANISMS

● IT IS OFTEN ASSUMED that in making use of one or more of the mental mechanisms of defense, the individual is behaving in an immature and unhealthy manner. Actually, were it not for the substantial array of mental defenses regularly employed by everyone, the behavior of mankind would appear extremely childish.

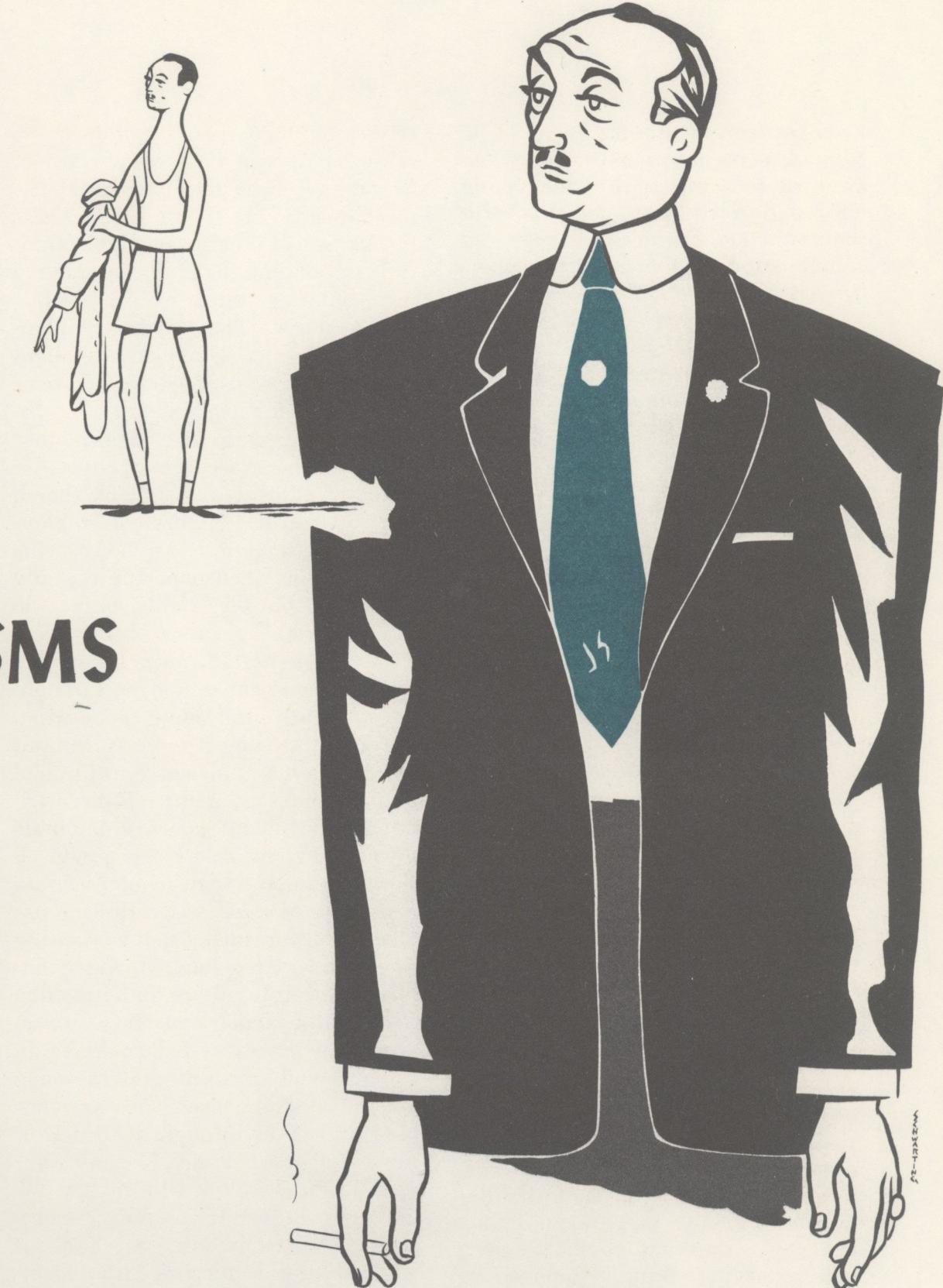
No individual could possibly reach maturity without having to curb, postpone, or otherwise modify certain demands of the instincts. The utilization of defense mechanisms enables the individual to convert excessive erotic, aggressive, and other drives into manageable form and to divert them into acceptable channels.

To illustrate the purpose of the mechanisms of defense, it is useful to view them through the perspective of their integration in the personality structure.

Defense as a function of the ego

Psychoanalytically-oriented psychiatrists regard the operation of the psyche in terms of opposing forces—powerful drives arising from the instincts, or *id*, are met with effective curbs imposed by the more responsible area of the mind, the *ego*. The psychic processes are aided, further modified, and censored by still another agency of the mind, that spokesman for conscience and cultural mores known as the *superego*.

The basis of this concept is that



the opposing forces are thought of as remaining in constant, violent struggle throughout life. Since the *ego* acts as mediator, reconciling the opposing forces at work in the psyche, it must subdue energy-charged stimuli arising from the instincts, take into consideration the censorship attempts of the *superego*, and insure that ultimate responses are in keeping with the demands of external reality as well.

Most of the conscious activities of the mind—thinking, deciding, willing, remembering—are performed by the *ego*. Not all *ego* activity, however, is conscious. The mechanisms

of defense typify ego function on the unconscious level.

Development of ego defenses

The infant learns early in life that not every impulse may be gratified immediately. He discovers further that certain instinctive drives must go forever unfulfilled if he is to be spared pain and if he is to receive the approval he requires. He learns by experience that the expression of certain tempting pursuits are associated with painful results. He meets external restraint in his attempts to kick and bite others, make fecal mud pies, engage in genital play, or push

his baby sister into the pond. The forbidden impulses persist, and when afforded the opportunity, the young child will gratify any of them. With the gradual emergence of the ego and subsequent development of the super-ego, however, the child becomes able to impose his own controls. Thereafter, unacceptable drives from within are met by restraining forces of the ego. Those impulses which are consciously and effectively subdued are said to be suppressed. But others, more dangerous ones, are designated by the ego as too painful to endure. Early in life, these impulses are hidden even from oneself, permanently relegated to the unconscious, and so repressed. Thus, repression becomes the most defensive effort of the ego.

"As long as repression is effective," states Nunberg, "the state of health is more or less balanced. Only when the repression fails is the dormant conflict revived with all its consequences." It is thus evident that the most significant consequence of the failure of repression is anxiety.

Anxiety as a sign of the need for defenses

Whenever a repressed impulse obtrudes into consciousness, anxiety results. The individual will then experience disagreeable feelings of tension, uneasiness and dread, with concomitant physical manifestations. Anxiety is symptomatic of the need for stronger defense measures to help continue the fiction that no forbidden impulse is trying to press into consciousness, that no conflict exists, that indeed, nothing whatever is amiss within the psyche. Roused to action by the ego, a number of complicated devices, unconscious in them-

selves, may be used by the ego to reinforce the process of repression. These have been termed the defense mechanisms of the mind. These mechanisms range from simple, alibi-type self deceptions to the completely incapacitating states, seen in conversion hysteria. The student of mediocre intelligence who makes excellent grades as a result of special diligence is making beneficial use of the mechanism of *compensation*. The mother who, when exasperated with her husband, "takes it out" by harsh treatment of her children is employing *displacement*. Anybody who misses a cherished opportunity, only to declare that he "didn't want to do that, anyway" resorts to *rationalization*. *Identification*, *idealization* and *introjection* are all employed throughout childhood and adolescence when the youthful subject pictures himself as a prototype of his current film idol and emulates as many of his attributes as possible. Excessive solicitude toward a hated relative is produced through the mechanism of *reaction-formation*. *Undoing* signifies the use of magical formulae, such as crossing one's fingers for luck during childhood, and compulsive handwashing in the obsessional neurotic. *Projection* is the process of externalizing an impulse and attributing it to someone or something else. The paranoiac uses projection through distortion of his feelings, as if to say, "I don't want to kill you, you want to kill me."

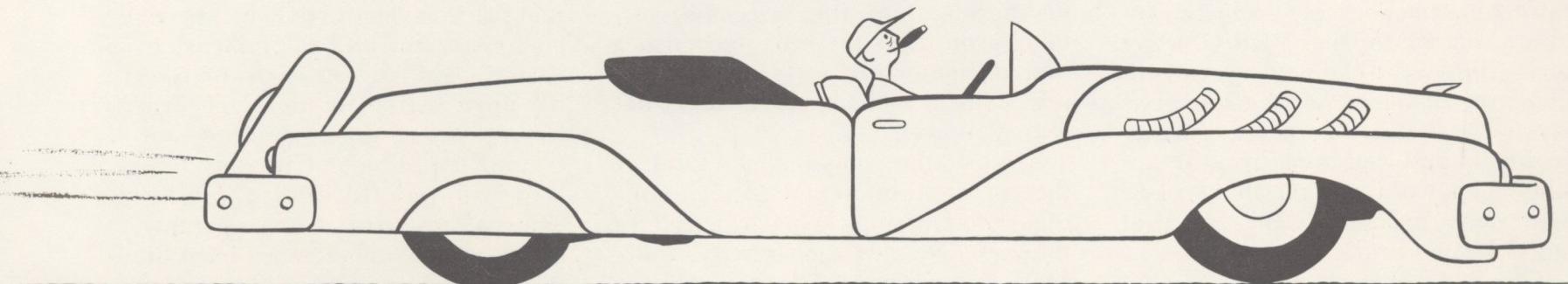
It is easily seen from even a cursory listing, that defense mechanisms serve a useful purpose, are unconsciously employed, and tend to be repeated continuously when once found successful. Some defense mech-

anisms represent more serious pathological involvement than others, and those used in neurosis serve to reinforce repression. These mechanisms are of only cursory interest to the physician who does not specialize in psychiatry. There is, however, one defense mechanism common to all the psychosomatic disorders which account for approximately half the patients seen in general practice. This mechanism is *symptom formation*.

The use of physical symptoms as a psychic defense

The term, "symptom formation" is used instead of conversion reaction because it connotes a wider variation of responses than those commonly found in conversion hysteria. The latter category included only disabilities of the voluntary muscle functions. In recent years, more and more physicians have come to believe that conversion also occurs in the autonomic system. The reason for this is that the process is the same as that in the other defense mechanisms. Symptoms appear in response to anxiety, and the symptoms provide relief therefrom. Consequently, the anxiety may not be perceived so long as the symptoms endure.

The common denominator with regard to symptom formation has been expressed simply by Nunberg, who states, "something psychic which is producing illness, is, for the time being, unconscious." The difficulty in management of patients with functional illness results from the fact that although symptoms are indicative of dysfunction, they are not pathognomonic of particular disorders.



Even fairly well-adjusted persons—the so-called normal individuals—develop physical symptoms that are exacerbated in response to prolonged frustrations in daily living. Usually, such symptoms are self-limiting and tend to disappear once the added stress is removed. In some instances, however, the symptoms continue even after the stresses which precipitated them no longer exist. When this occurs, the status of the ego relationships may well be assessed. An important factor is the patient's attitude toward his illness, much of which may be ascertained from the manner in which the symptoms are reported. Some patients derive obvious satisfaction in chronicling their ills, and seem to resent being interrupted if they dwell unduly on minute details. It is often apparent to the physician that the symptoms serve some useful purpose to the patient. Mild therapeutic measures, together with an effort toward ego-support can sometimes achieve good results with such patients. The patient will have sought out one particular physician because he regards him with respect and awe. The very fact that the physician is personally interested in the patient, understanding, and concerned with his welfare may prove a valuable ego-strengthening device. The importance of this role in the management of this type patient cannot be overstressed. In some instances, slight environmental changes may be suggested by the physician, and a double-barreled attack on the stressful situation may be obtained. Also the physician may get the patient to see the relationship between the appearance of his symptoms and some disturbing incident in his life. The physician can explain that it is quite common for such reactions to occur, but also that it is a terrible waste of energy for them to continue when the situation no longer warrants them. Most patients with functional illness find their symptoms useful but not absolutely necessary. Appropriate medication and sympathetic interest will usually insure a good prognosis for such patients.

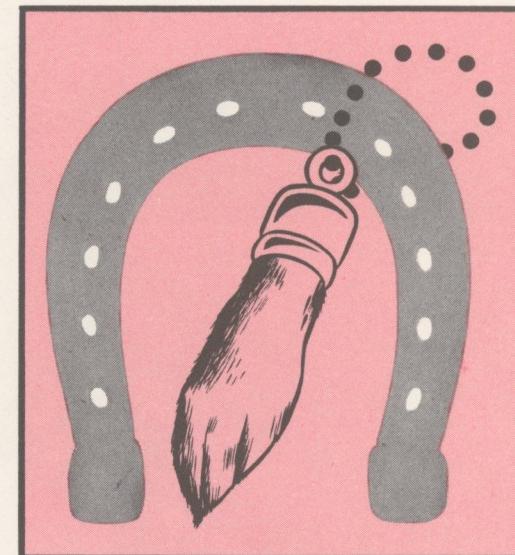
Quite a different picture is presented, however, with the neurotic whose ego balance is precarious. This type of patient needs his symptoms desperately. Without strenuous re-

orientation of the personality, it would not be safe to remove the symptoms even if this were possible. Every physician has seen patients who tend to switch unaccountably from one set of functional symptoms to another. First, it is the cardiovascular system which appears to be involved, then there is some malfunction of the gastrointestinal tract, later other complaints which necessitate all manner of therapies and manipulations. Such a patient, because of deep-seated and agonizing conflicts, cannot permit himself a healthy existence free from pain. Through the mechanism of conversion, illness affords this patient protection from overwhelming anxiety and beyond that from a far greater danger, unbearable repressed material from instinctual drives. With some of these patients, psychoanalysis has uncovered this repressed material with occasionally drastic results. In some instances, patients have responded with psychotic episodes or attempted suicide. The individual who suddenly is confronted with more instinctual stimulus energy than the ego can manage and whose customary defenses are no longer operative, needs every protection that can be provided through hospitalization, tranquilizing measures, and constant observation.

When the physician in general practice suspects that a patient is actually a seriously disturbed personality—a person who is using physical symptoms as a major psychic defense—he might bear in mind the consequences which may occur should the defensive structure break down. Usually, these patients do not want to be rid of their symptoms not because they wish to be sick, but because their complaints represent their tenuous hold on health. If such patients fail to respond favorably to therapy, the physician need feel no self-recrimination. It may be that the ego support derived from frequent and varied ministrations by the physician will enable a patient to carry through his daily endeavors fairly well.

In a patient with conversion symptoms, defenses which have long served their intended purpose may gradually become inadequate with the passage of time. Ego control then becomes precarious. Should the physician believe, by reason of unac-

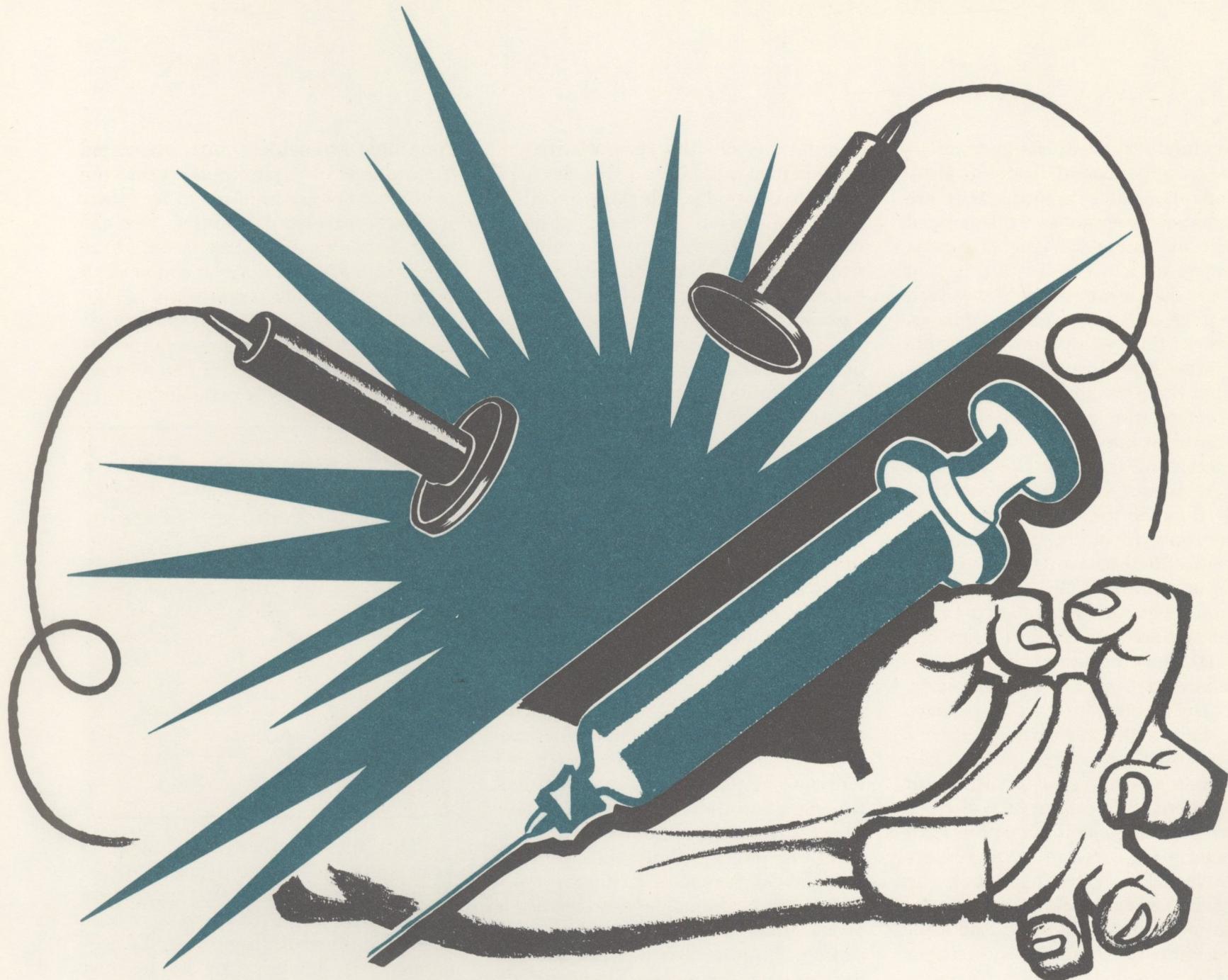
countable intensification or too rapid fluctuation of symptoms, that the psychopathology appears to be growing more severe, psychiatric referral may be advisable. Any attempt at referral, however, may be expected to provoke strenuous opposition in the patient. This, in itself, is a danger signal, and every means should be taken to insure that competent psychiatric assistance is provided.



With these patients it is well to keep in mind Knight's admonition, "Let each patient, then, be studied as a human being in distress, whose manifestations of illness can be understood if enough can be learned about him, and who can be treated with a therapeutic program which utilizes this comprehension, rather than be viewed as a stranger with annoying complaints and troublesome symptoms to be immediately subjected to strong-arm purging methods."

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THE HISTORY OF SHOCK THERAPY

● Electroshock therapy has a colorful history. That physical shock might be inherently curative is one of the oldest ideas of therapy. Mental patients have been startled, flogged, plunged into cold water, or tortured, since the beginnings of medical history. The observation that both accidental physical shock and the convulsive states had remissive effects upon some mental disorders was made many times in the development of the science of psychotherapy. Pro-

duction of epileptiform convulsion by electricity is also an old idea, and the electrotherapies require a detailed history of their own. The utilization of electricity even antedated the isolation of electric energy!

In the time of the Emperor Claudius, the principle of "vibration" or friction as a curative measure was popular. The Roman, Scribonius Largus, physician to the emperor, was author of a formulary in which he recommended applica-

tions of live electric eels for chronic headache. Pliny and Dioscorides mentioned comparable remedies.

Another royal physician introduced the word "electricity" in the *Tractatus de Magnete*, in 1600, and from that time until the 18th century there were many electro-physical experiments, but apparently no significant attempts at medical usage. After 1730 there were efforts to utilize electricity in every branch of medicine but most particularly for nerv-

ous or mental disease states. Stimulation was the intent of many of these experiments, and patients with paralysis and epilepsy, as well as those with hysteria and melancholia were so treated.

From 1744, reports on electrotherapy were published every other year by the *Histoire de l'Academie Royal des Sciences* in France, and by 1767 electricity was utilized in British hospitals. This period also offered wide opportunities for charlatanism. Popular belief that electricity was a salutary influence gave rise to assorted forms of quackery. These "therapies" had nothing to do with the production of convulsions. Instead, the idea of healing or rejuvenation through stimulation was exploited. This was the period of Graham's Temple of Health, with magnetized baths to "communicate" electricity, and of the Swiss physician, Schuppach, the "mountain doctor."

From the time of Benjamin Franklin there have been too many contributors to include mention of them all. Cures were announced as early as 1744, and by 1755 there had been an electrically produced convulsion with subsequent cure of the patient. J. B. Le Roy gave four "commotion" treatments to a patient with hysterical blindness. After the first treatment the patient saw light for the first time, and after the third he fainted. He did regain his vision, and a similar case was cured by the same method in 1801, by F. L. Augustin. Electrotherapeutic treatments came to include spark treatments, electric baths, franklinization, vibrators, shocks with the Leyden jar, electrical percussion instruments, static breezes, and combinations of medicinal substances with electricity. Giuseppe Bruni, for example, filled a glass cylinder with purgatives, and placed it inside his electric apparatus. The "electrified" patient supposedly was affected as if he had taken the medication internally.

In the 19th century electricity was less a novelty, and electrotherapy was the subject of many European textbooks. The contributions of Galvani, Volta, and Faraday altered the forms of therapy, although static electricity was still employed. The popularity of many techniques was dissipated, however, and failures of

cure discouraged many investigators. Nevertheless, by 1870 there were attempts at producing convulsion by electrical stimulation of the cerebral cortex. In 1902 and 1903 electric sleep and electrically induced coma had been attempted.

Related therapeutic procedures had evolved by the twentieth century. The old idea of curing an illness by fright came, indirectly, to be employed. As early as 1787 Scheidemann had listed a group of disorders that could be cured by shock, and accidental physical shock was known to alleviate psychotic states in some instances. In explaining the background to his experiments with insulin, Sakel mentions convulsion induced by asthmatic attack, drugs, strangulation, and accidental electric shock that brought about remissions of psychotic conditions. Pascal and Davesne had written of colloidoclasia, and, much later, Klemperer had discovered beneficial effects of hypoglycemia in some mental states. Sakel, by 1927, was administering insulin to human subjects, and the Classical Sakel Shock Treatment was inaugurated. In Budapest, in 1924, Meduna gave his first injection of epileptogenic camphor to a patient.

The epileptogenic administration of camphor had also its early forbears. An especially distinguished one was Leopold Joseph von Auenbrugger, renowned for diagnostic auscultatory percussion of the chest. Auenbrugger reported giving camphor orally every two hours to ten mentally diseased patients. Eight of these patients recovered; one died; and one alternated stages of apparent recovery and relapse.

Both insulin shock and cardiazol convulsive treatments were in use when Cerletti and his coworkers began their experimental studies of brain pathology in epilepsy. Electricity was chosen as the agent, because of the possible alterations the drug convulsivants might cause in the brain tissues of the dogs used for microscopic study. No agent of convulsion, whether electrical or pharmacological, was assumed to be at all curative. The intent was always to induce the effect upon diseased states known to result from epileptiform convulsion.

At the time the idea of such shock

to a human subject was associated with the electric chair. He had been told that at an abattoir in Rome swine were slaughtered by electricity. When he went there he found this to be untrue. The animals were killed without pain during a comatose period induced by electricity. After observing this procedure he decided to use hogs in his experiments instead of dogs, and to reverse his previous plan. Instead of trying to determine the minimal amount of current to induce a complete seizure, he decided to ascertain the maximum amount that could be safely given.

Cerletti, Accoremo, and Bini, who were working together at this time, went to Vienna to learn from Sakel his techniques. Cerletti and another coworker, Longhi, also utilized intravenous cardiazol, according to Meduna's methods. In April of 1938, in Rome, electrically induced convulsions were attempted for the first time with a human subject by Cerletti and Bini. The patient was a schizophrenic and a cure was, in time, effected. When Cerletti described his research and its results he made it clear that this application of electroshock was not an invention. He called it, instead of a discovery, an act of courage to take the responsibility of passing from the possible application to the practical one.

The variations and the subsequent developments of the shock therapies are another story. The announcements between 1933 and 1938 of the three "new" techniques followed a legend from Scribonius Largus, Gilbert, Franklin, Remak, Duchenne, Oliver, Pascal, and Auenbrugger, to Sakel, Meduna, Cerletti, and Bini.

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● AN IMPENDING OPERATION can be much more disquieting to an aged patient than to a young person. Elderly patients often are bewildered by hospital procedures or may fail to accept the necessity of adapting to institutional routines. Economic problems, such as cost of hospitalization and financial dependency, may also be sources of disturbance. In addition, patients of advanced age are subject to exaggerated apprehensions and fears.

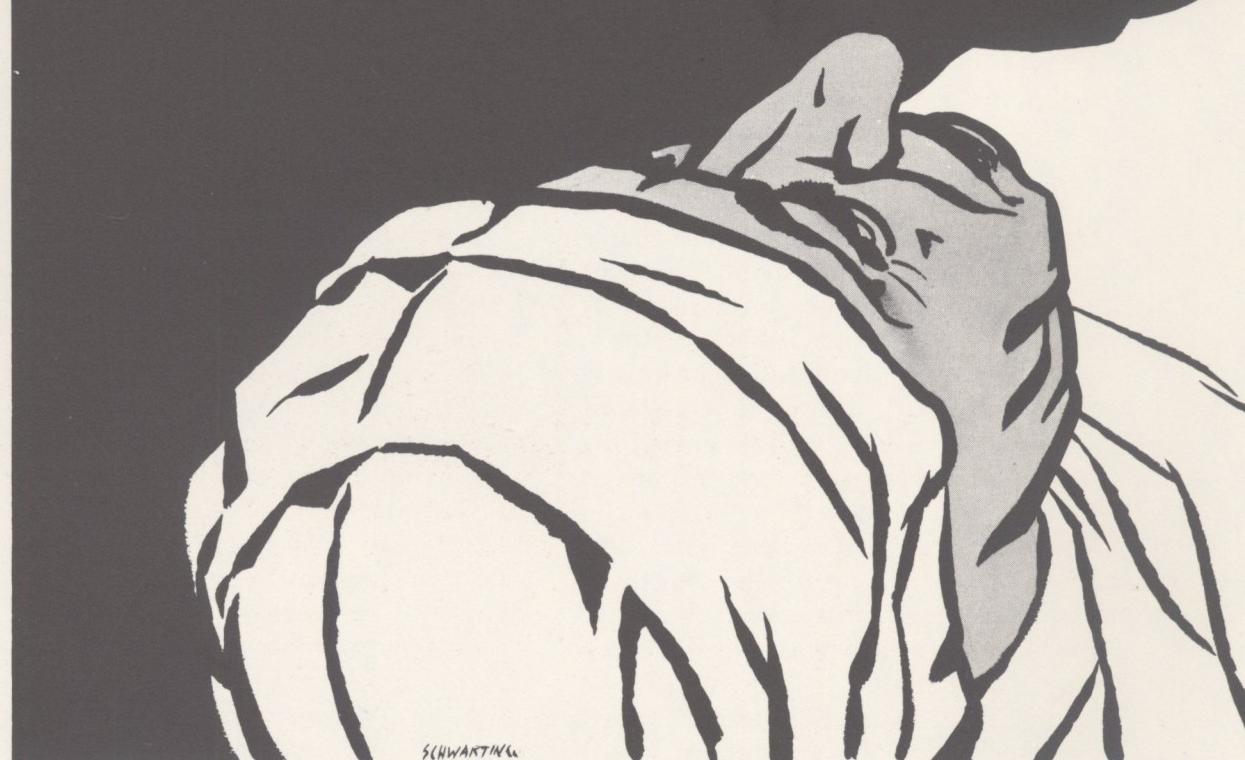
The psychologic status of the patient before surgery is extremely important. In some instances, the ultimate success of the procedure may depend more on the thoroughness of preoperative preparation than on the surgeon's skill. The physician should be aware that brain function may decompensate under stress of operation, as well as heart, kidney, or liver function. In addition, attention must be given not only to essential physical preparation, such as restoration of fluid and electrolyte balance, but also to the patient's mental state as well. A surgical procedure not only causes trauma to the body but may also cause injury to the personality.

Postoperative neuroses and psychoses

According to Noyes, the patient's emotional investment in the organ or organ system to be operated upon may be a contributory factor in precipitation of neurotic or psychotic reactions. For example, psychoses are most frequent after operations upon the eyes and the genital organs. In a recent study, Titchener and others reported delirium as a frequent first sign of mental deterioration. In elderly patients this may result in development of chronic brain syndrome or some less severe defect in mentation. These investigators also found that older persons, when deprived of the closeness and support of family and friends, developed organic psychoses after the stress of operation more often than patients whose families maintained close support.

Most investigators do not believe that postoperative psychosis is a separate disease entity with a distinct pattern of development and a particular etiology. Rather, the consensus is that the potential for severe emotional disturbance is high when patients with pre-existing personality

Psychologic Problems in Geriatric Surgery



SCHWARTZ

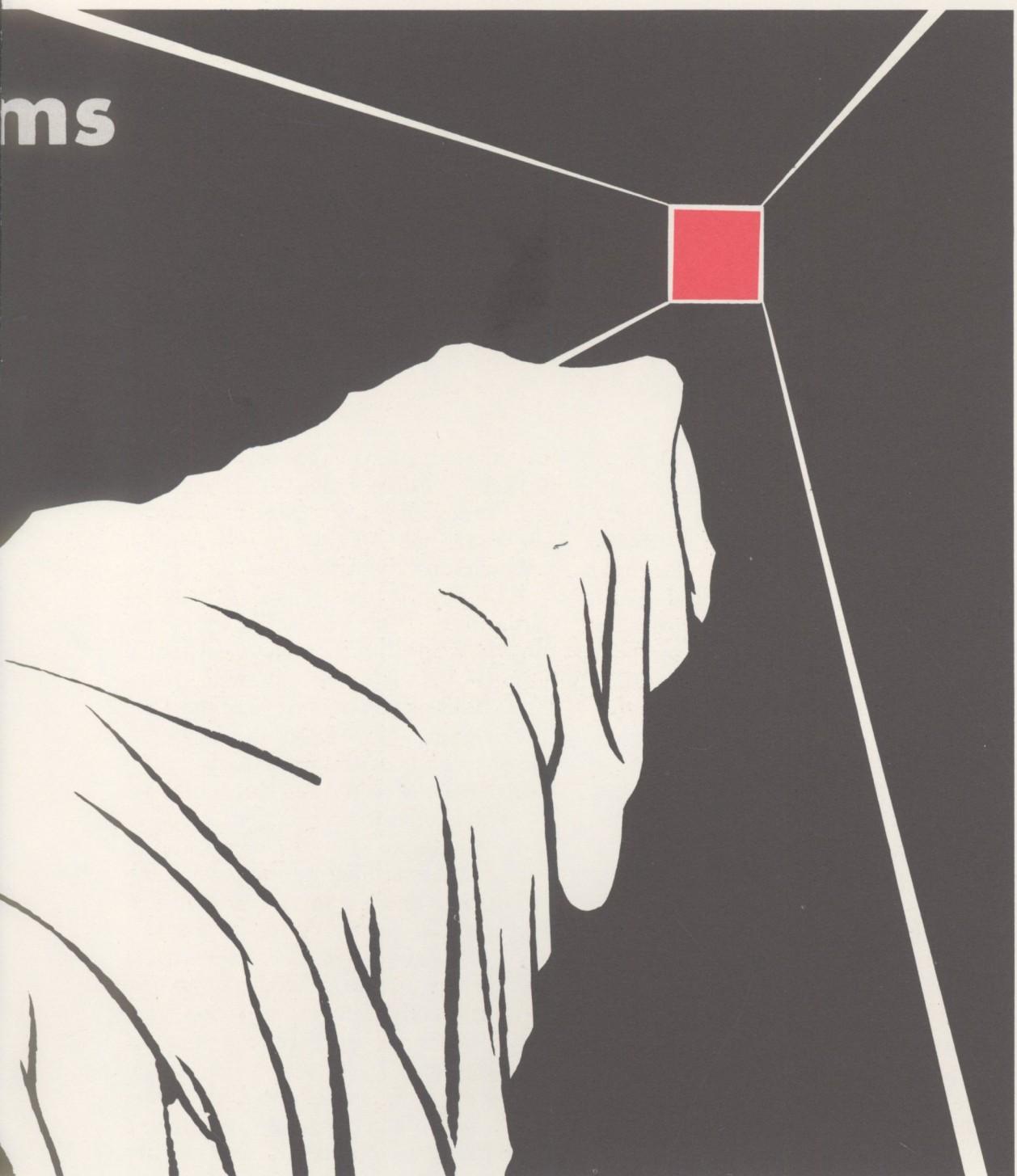
disorders are subjected to the physical and psychologic stresses incident to a major surgical procedure.

In assessment of cerebral reserve in aged patients, Ibberson recommends use of the "100 minus 7" test. In this test the patient is asked to subtract 7 from 100 and then continue to subtract 7 from each answer. The rapidity and accuracy of the answers are less important than the patient's reaction to the test. If cerebral function is limited the patient will become confused and unable to manage the problem at all. Such a patient should have further preoperative appraisal.

Preoperative preparation

The family physician who has been

responsible for the patient's previous care can give the patient psychological support, not only in the preoperative period but through hospitalization. Usually, he understands the patient's personality and may, therefore, be able to predict what factors could precipitate an emotional disturbance. Moreover, if he has the patient's confidence, he is better able to discover the sources of anxiety. Sometimes a patient will hesitate to express his fears, and his apprehension may be discovered only if the physician introduces the topic in conversation. The type of operation to be performed should be explained from the patient's viewpoint. One



possible reason for exaggerated fear of operation on the genital organs is inadequate understanding of the surgical procedure and its effects.

Even if the patient is considered beyond active sexual life, he may fear that removal of the prostate will cause diminution or loss of libido or potency. The patient should be given a simple explanation of the operation and reassurance that loss of potency is not an inevitable result.

Fear of the anesthetic, which sometimes is greater than fear of the operation, can be allayed by giving the patient a step-by-step description of the actual procedure to be used. He can be told, for example, that he

will be given a sedative the night before the operation to insure a good night's sleep, and a hypodermic injection the next morning so that he will not need as much anesthetic. Unless the older patient knows exactly what to expect, any hospital procedure may make him suspicious, hostile, or difficult to manage.

Obviously, the patient's convalescence will also be influenced by his emotional state. The alert elderly patient who is interested in the details of his operation and who is eager to return to normal activity has a more favorable prognosis than one who is apathetic and resigned. Because a patient tends to accept un-

pleasant procedures more readily when he knows about them in advance, he can be prepared in the pre-operative period for what will be expected of him after surgery. For example, early ambulation is a generally accepted principle of modern surgery. The patient will cooperate much better if the advantages of such a program are explained. A preliminary explanation of deep breathing exercises can include the information that they will help to prevent nausea and pneumonia. If the patient is given reasons like these, at a time when his mind is unclouded by pain or sedatives, his response may be more favorable during the postoperative period. Over-sedation should be avoided in elderly patients, because it often precipitates disorientation.

Elderly persons require several days to adjust to new surroundings and new routines; therefore, several days of hospitalization before operation may be advisable. There should be as little change in the patient's routine as possible. If hospital procedures seem to be a source of concern, the reasons why they are necessary should be explained carefully.

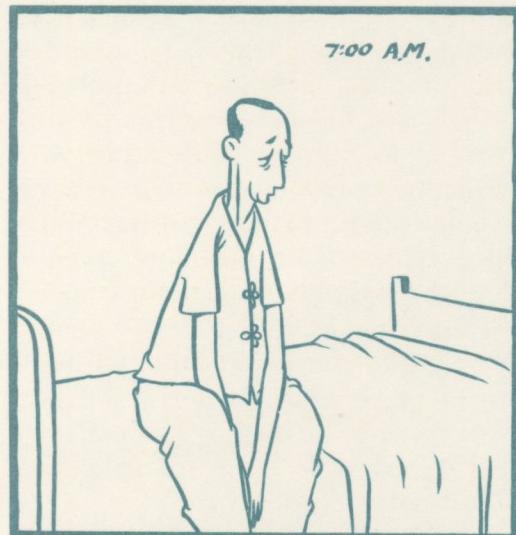
Conclusion

In the preparation for surgery, the physician should be aware that the elderly patient may be subject to fear, ignorance, apprehension, or resentment. Therefore, the patient should be given ample opportunity to talk about his problems and to ask questions. After a satisfactory interview, he may be restored to a state of mental equilibrium which will help sustain him even after the operation has been performed. The effects of surgery will diminish much more rapidly in such a patient. He will have less pain and nausea, will begin ambulation earlier, and will return to full activity in a shorter time.

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NEUROCIRCULATORY ASTHENIA



● NEUROCIRCULATORY ASTHENIA has been identified by various terms and although it is not included in official psychiatric nomenclature, is still widely used. In current usage, neurocirculatory asthenia is most commonly considered a cardiac neurosis or a manifestation of anxiety neurosis. Anxiety or maladjustment to environment is often expressed somatically. In cases of neurocirculatory asthenia, patients respond to physical effort or emotional stress with a particular and well-known physical response. Although the term seems to connote a structural disorder, this particular "reactive entity" exists in the absence of organic heart disease. The symptomatology is easily recognizable, even though the causative factors may be controversial and the name misleading.

Signs and symptoms

Patients with neurocirculatory asthenia may complain initially of left inframammary pain, breathlessness, palpitations, fatigue, transient dizziness, and depression. Sighing respira-

tion, tachycardia, palmar sweat, tremor, and labile blood pressure are also noted. The symptoms include tinnitus, general weakness, syncope, and decrease in exercise tolerance. The characteristic precordial pain and dyspnea suggest coronary disease both to the physician and the patient, and the accompanying hyperventilation is also misleading. Actually these elements are easily dissociated from organic disorders. In a study of 200 cases of neurocirculatory asthenia, hyperventilation was found to be an aggravating factor rather than a causative process. According to Perk, anxiety can bring about coronary spasm and conversely, coronary spasm may cause anxiety. In neurocirculatory asthenia, however, the anxiety is manifested in symptoms of coronary disease without structural changes in the coronary vessels. Electrocardiographic studies reported by Wolf and associates were instructive as to the effect of effort upon such patients. During interviews, if personal, anxiety-producing problems were discussed, the electrocardiographic complexes were comparable to those obtained after exercise.

Etiology and pathogenesis

The etiology of this disorder is unknown. Deficient carbohydrate metabolism has been suggested as a pathogenetic factor. Head trauma, hypoglycemia, and a history of rheumatic fever, meningitis, or diphtheria have been considered causative factors. Since the clinical manifestations appear related to the diseases of adaptation, pituitary and adrenal hyperactivity in such patients may be significant. Influences upon the development of neurocirculatory asthe-

nia are both psychogenic and constitutional. Three factors that seem to be important are family history, physical inadequacy or inferiority, and personality structure.

The family history is indicative in patients with neurocirculatory asthenia. The familial incidence of cardiac neuroses, childhood behavior problems, and of alcoholism is high. One investigator found that when both parents had neurocirculatory asthenia, 61.9 per cent of their children were also affected.

In assessing the preconditioning factors, it is difficult to separate the hereditary and the environmental influences. In patients with family history of cardiac neuroses there must have been an early effect upon the patient's body image formation, one associated with a particular kind of dysfunction. Early suppression and over-protection with later domestic stress may determine "the vegetative expression of emotion." Wood has commented on the function of insecurity in predisposing the individual to psychoneurosis. Perk has said, "Predisposition . . . creates the appearance of something formal and static residing within the mind, or perhaps a spring set for action . . . But it is more than that. It is also something dynamic, a ferment of conflicts and strivings which keeps changing the . . . susceptibilities it imposes on the individual and shapes the reaction that results from the clash with the environment."

Constitutional inferiority is a common finding among patients with neurocirculatory asthenia. Physical defects, often less severe than the patients believe them to be, are a part of the clinical description. A history of delayed convalescence from

some illness is usually reported, and some patients have been accustomed from early childhood to avoid strenuous activities because of mild or even imaginary disabilities. Patients have been described as having little natural stamina, postural defects, flabby muscles, and poor nutrition. In an early study cited by Weiss cases of neurocirculatory asthenia were grouped into three categories: those with physical inadequacy, those who responded to physical inadequacy in a neurotic fashion, and those who were primarily neurotic.

Obviously, patients with this disorder are poorly adjusted emotionally. Most of them are of the obsessional type, characterized by tension, rigidity of outlook, and preoccupation with problems of duty and responsibility. Their apprehension and lack of self-confidence are aspects of what is perhaps the most consistently-found trait, that of timidity. A timid person might be expected to feel over-conscious of physical inferiority. Furthermore, when conditioned by the family background common to such cases, such an individual would manifest the passivity and the hypochondriasis so often reported in patients with neurocirculatory asthenia.

Bodily response to emotional strain may be partially determined by the body image. The symptomatology of neurocirculatory asthenia, then, when considered in relation to a diffident, anxious, fearful patient, may signify deeper disturbances of the personality. For example, the breathlessness and sensations of suffocation are comparable to the claustrophobic reactions. The thoracic pain may connote guilt and self-punishment for feelings of aggression, while affording, at the same time, a means of escape from a situation of conflict.

The passivity may relate to unrecognized homosexual impulses.

There are, according to Badal, three principal psychologic trends in patients with neurocirculatory asthenia—the phobic, the hysterical, and the hypochondriacal. In his discussion of the psychoneurotic components of the disorder, Badal explains that such patients have developed a sense of helplessness when confronted with environmental difficulty, as well as a set response of passivity. In a stressful situation, such a patient feels powerless and anxiety results. The patient characteristically becomes body-conscious, and his interest in the conflict is displaced to the somatic symptom. The mechanism is self-perpetuating, and the patient consistently reacts with physical complaints that prevent his meeting a problem actively, and that also exclude him from a performance for which he is incapable.

Therapy and prognosis

A scrupulous history-taking and thorough physical examination will usually enable the physician to differentiate neurocirculatory asthenia from organic disease. These two procedures also are therapeutic if the physician is able thereby to convince his patient of the absence of heart disease. Psychotherapy is initiated if the patient's fears can be alleviated and at the same time the patient's trust in the physician is preserved. Minimizing the importance of the disorder does not diminish the pain or dyspnea. Actually, greater understanding and tact are needed from the physician than in cases with anatomical lesions. Explanation of the effects of anxiety and of the endocrine responses to stress is required, and, in some instances, judicious

usage of some mild sedation may relieve the patient's nervousness. If the relationship between patient and therapist is such that the former can speak freely of his problems and the latter can demonstrate convincingly the absence of any dreaded organic disease, the therapeutic program is well advanced toward success.

While there is no specific treatment or set period of time for neurocirculatory asthenic patients, the prognosis is good. Although patients with a history of such attacks from early youth will often continue to experience them, little disability results and the mortality rate is comparable to that of the general population. Also, such patients do not develop any of the diseases commonly assumed to be provoked by anxiety to any greater extent than the rest of the population. Although anxiety can literally affect the size and rate of the heart, patients with neurocirculatory asthenia usually do not develop coronary disease or dysfunction.

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The Prospect of Paternity

● IN SOME PRIMITIVE SOCIETIES the behavior of the expectant father is strictly ritualized. Taboos are often placed on his activities. Dietary restrictions, work prohibitions, or the lying-in of the father may characterize this custom of "couvade." There are several theories for these primitive rituals. The father, by means of the couvade, may be passively asserting his rights in the child. Another theory is that the child has been separated from the father; consequently, both are weak and need support. Also, the custom has been interpreted as a form of protection of the child from injurious acts of the father. In modern societies, however, there is no comparable ritual to protect the father from the conflicts that may precede parenthood.

Apart from the pride conventionally expected of the prospective father, the physician may notice several empathetic reactions. It is not uncommon, for example, for the husband to complain of gastrointestinal discomfort typical of morning sickness. In some instances, the husband will show an increase in appetite similar to that of the expectant mother. However, when these "sympathy pains" become severe they may be symptomatic of a lack of emotional preparation for parenthood. The husband may complain of sudden headaches or of nausea. He may begin to drink excessively and to show a sudden decrease in efficiency, sometimes to the extent of loss of employment. When the fact of prospective fatherhood precipitates an underlying psychoneurosis there may be symptoms

of irritability, depression, or hypochondriasis. Finally, when the prospect of fatherhood precipitates a latent psychosis, there may be attempts at suicide. These reactions, of course, are more than empathetic reactions of the patient to his wife's symptoms.

To the emotionally unprepared patient the thought of becoming a father may signify loss rather than gain. The prosaic assumption of responsibilities may denote an end to love when the concept of love is immature or undeveloped. If a tenuous marital equilibrium existed before the pregnancy, the birth of a child may represent a trap. And, to the prospective father who prefers to wander, the settling influence and possible future demands of a child may constitute an encumbrance. When the wife represents a mother substitute for the patient, the expected child may become a rival to the patient's position of dependency. Thus, a patient recently hospitalized before the birth of his child described his marriage as a "betrayal." A history of this patient showed a predisposition to strong passive-dependency, both engendered by and directed toward the wife. When the passive-dependent relationship is threatened, a psychotic solution for survival is seen in the patient's withdrawal to more infantile levels of behavior. There may be soiling, urinary incontinence, and attempts to nurse at the breast. Towne and Afterman cite an instance in which a patient, definitely passive-dependent, attempted to climb into the baby's crib. Denial is another method employed in at-

tempts at psychotic retrenchment. In such cases, the physician may observe a denial of parenthood or a denial of hostility toward the wife. "My wife is married to someone else . . . the child isn't mine," are characteristic comments. Frequently a presenting symptom of psychotic denial is increased excitement or exaltation. For example, a patient hospitalized during the fifth month of his wife's pregnancy had previously become increasingly confused and had "acted like a little child." A son was born four months later, and, after a period of withdrawal, the father became unmanageably hyperactive so that his transfer to another ward was necessary. Another case history, also cited by Towne and Afterman, illustrates the temporal relationship between an outbreak of psychosis and pregnancy or birth of a child.

The patient, a 29-year-old miner, was observed during his third hospital admission, after a suicide attempt by the ingestion of lye. A clinical case history of the patient disclosed that a series of similar attempts had been made after the births of his other children. As a child, the patient had been made aware that he was a "burden on the declining years" of his parents. His father died when the patient was twelve years old and he became emotionally dependent on a suddenly possessive mother. In 1945 he married an aggressive, competent, and domineering woman who was already five months pregnant. After his marriage, the patient cut his wrists and was admitted to the hospital for the first time. Here he stated, "I was sick

because my wife was pregnant and so could not help me as she had helped me in the past." Another child was born in 1950 and the patient was hospitalized again, only to be readmitted in 1951 when his wife was near term. The patient was finally sent out on trial and was readmitted six months later, after another attempt at suicide.

Symptoms of disturbance in relation to prospective paternity may be relatively mild and require from the physician only a few words of reassurance. Indeed, it appears normal for the expectant father to identify with his wife and child. Certainly

this identification may aid the father or expectant father to become more responsive to their needs for love and care. However, if the physician observes symptoms that could signify the onset of a severe emotional disorder, an interview may obviate an increase of these symptoms. Frequently information concerning sexual abstinence, the development of the fetus, the effects of pregnancy on the wife, and realistic problems of finance and housing, will prevent the development of a prolonged maladjustment. Only the more difficult cases require psychiatric referral. Psychotherapy may be necessary for

the expectant father whose emotional conflicts are more related to complex underlying factors than to the actual anticipation of parenthood.

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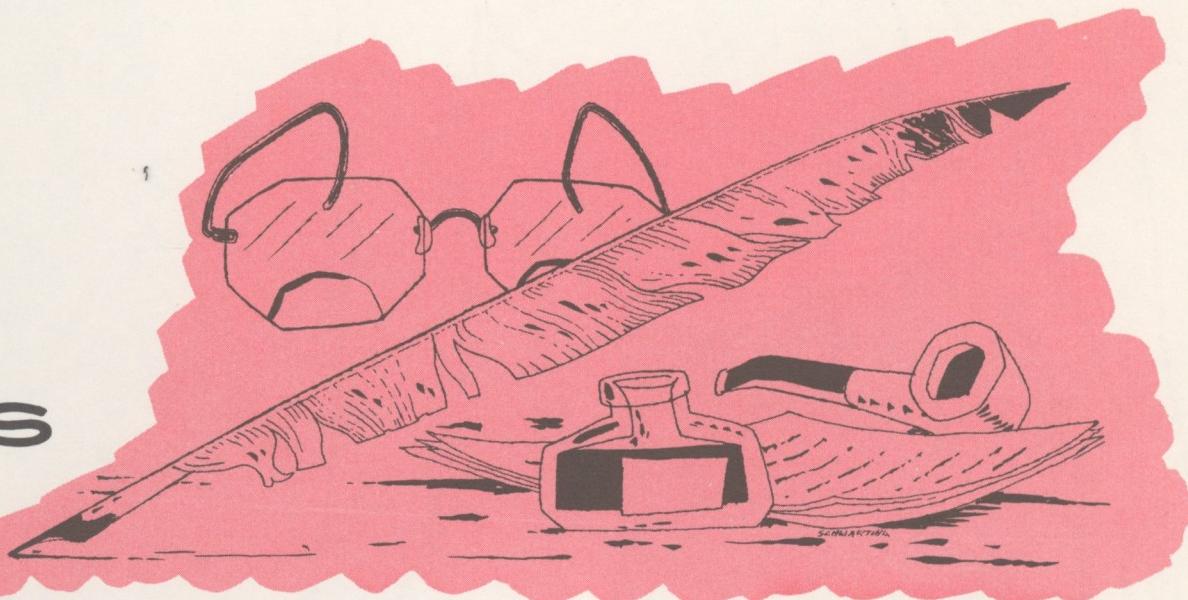
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Book Reviews



THE PRACTICE OF PSYCHIATRY IN GENERAL HOSPITALS. By A. E. Bennett, M.D., E. A. Hargrove, M.D., and B. Engle, M.A., with ten contributing authors. Pp. 178. Price \$4. Berkeley, University of California Press, 1956.

Every general hospital should be just what its name connotes, and this is the argument supported by this group of authors. The need for psychiatric hospital facilities has long been established statistically. In this volume the authors discuss such additional practical matters as the permanent qualified staff, training programs, administration, and architecture. Problems of referral, special therapeutic procedures, and medico-legal aspects are also included. One chapter, written by D. Ewen Cameron, M.D., is on the subject of the particular values—and difficulties—of day hospitals. Throughout the volume the authors emphasize the

necessity for integration of psychiatry into general medicine for combined effort in solution of the nation's greatest health problem.

THE NEUROSES IN CLINICAL PRACTICE. By H. P. Laughlin, M.D. Pp. 802. Price \$12.50. Philadelphia, W. B. Saunders Company, 1956.

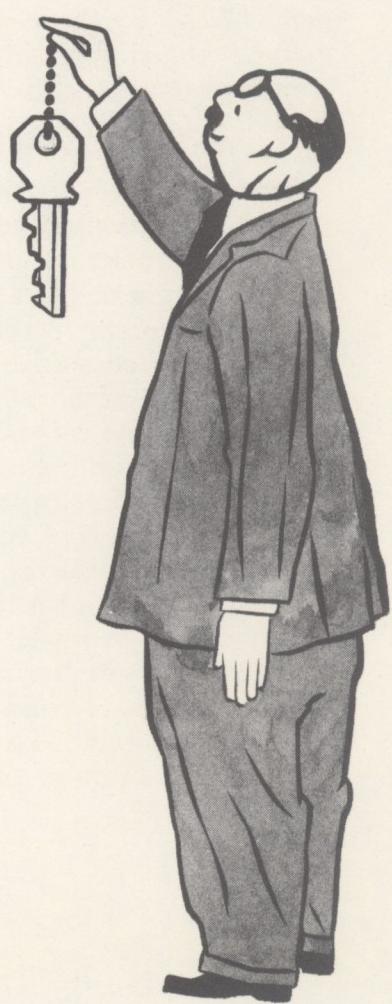
This instructive and well-outlined discussion of the neuroses is illustrated with 216 case summaries, all of which, like the rest of the author's material, are presented with clarity and with considerable detail. The whole much-needed volume is well-arranged for reference usage, is amply indexed, and the presentation of much of the information is in tabular form. Of the book's fourteen chapters, twelve contain summaries, and all of them conclude with reference lists. A classification of emotional and mental illnesses is included, and there is a 51-page glossary. This interesting volume should be a useful

addition to any professional library.

EVERY OTHER BED. By M. Gorman. Pp. 318. Price \$4. Cleveland, The World Publishing Company, 1956.

In this volume by the Executive Director of the National Mental Health Committee the increasing need for research into the causes and cures of mental disease is thoroughly emphasized. The discrepancy between the cost to the nation of mental illness and the available funds for research, development of drug therapies, and training of personnel is comprehensively discussed and fully documented. The book contains quotations from many scientists and public figures concerned with the problem of mental health, and, even more important, gives the statistically-established facts about this important national health problem. The volume is indexed and the bibliographic references, divided by chapters, are listed at the end of the book.

JUVEN



ROLE DELINQUENCY

● THE TERM "JUVENILE DELINQUENCY" is currently used to designate a variety of negativistic acts and antisocial patterns of behavior. A specific diagnosis of the underlying motives of such behavior is not, however, provided by this general designation. Theories of the effects of environment have, to a degree, been nullified by the fact that many individuals attain constructive and integrated adulthood although their formative years were spent in actual poverty. Also, the traditional psychoanalytic theory of childhood repression, with subsequent instinct frustration and neurotic "acting out," appears increasingly untenable. Such a theory does not, for example, account for the presence of approximately 1,300,000 juveniles who appear annually before the courts. Consequently, Johnson and other researchers during the past decade have studied cases of delinquency in families of good background and reputation. Both the parents and the children involved in the antisocial acts were given psychiatric appraisal. As a result of these studies, Johnson and Szurek state that "it becomes unmistakably evident that one or occasionally both parents derive unconscious, and less frequently, conscious gratification of their own poorly integrated forbidden impulses in unwittingly sanctioning and fostering such behavior in the child. In every patient brought for treatment, in whom simultaneous intensive study of the parents was possible, the child's defect in conscience was traceable to a like defect in the parent's own poor resolution of unconscious impulses to similar antisocial behavior."

The concept of permissiveness suggests that in families in which there are several children, the parent may

unconsciously select and take pleasure in the plight of one child. The child may be a son, for example, who resembles the ne'er-do-well brother of the mother. It may also be a daughter "who should have been a son." Permissiveness, however, may be of a less obvious, although equally persuasive nature. It may be inherent in the innuendoes of communication, or arise from inconsistent behavioral requirements by the parents.

Parents may convey an attitude of permissiveness by subtle means of communications which are used without conscious awareness. For example, a father who feels constrained by a routine job or by the restrictions of married life, may reveal pleasure in his four-year-old son's running away from home. This covert sanction may encourage a repetition of the behavior and may also negate the implications of subsequent punishment. The physician may become cognizant of many indirect implications in double talk, in subtle facial expressions, and in the content of direct statements. An underlying attitude also may be revealed by parents who dramatize the actual interchange between themselves and the child. A mother may say of her daughter, "She is a shy girl—never allows a boy to kiss her or go further." It is possible that the mother is attempting to secure vicarious gratification for her own repressed adolescent impulses. Moreover, such an attitude may provoke the child to behave in a manner that would otherwise seem basically impermissible.

Inconsistency of behavioral requirements

When one parent encourages the child to behave in direct opposition to the mandate of the other parent,

the child may be expected to use deceit in parental relationships and in social ones. Also, inconsistency may be characterized and permissiveness evoked by lenient attitudes toward sexual mores. The mother who habitually sleeps with a preadolescent son and especially if her conversation is preoccupied with sexual topics, may be establishing a formidable behavioral precedent. Matricide has frequently resulted from such frustrating situations of parental permissiveness. This situation may be seen also in the father whose caresses of an adolescent daughter exceed mere paternal affection. Exhibitionistic displays of nudity by parents or adult members of the family may also connote permissiveness. Moreover, children may actually feel ill-at-ease in the presence of such behavior.

Juvenile defiance

In re-examining causes for juvenile delinquency, Redl has noted that an "optical illusion" of crowd boisterousness may appear as a result of individual cases of delinquency. This theory, obviously, does not apply to similar displays of group contagion often seen in adult behavior. Separate instances of delinquency do not, for example, account for the destructive mass conduct observed in rallies, political campaigns, or the conventions of fraternal organizations and business federations. The question is raised, therefore, as to how one personality may sustain a system of values under group pressure and another personality may not. Recognition of this problem also makes apparent the necessity of assisting and enabling the individual to maintain his self control in group situations. Research in this aspect of

behavior brings into relief the differential nature of defiance, and Redl outlines several possible sources: (1) *Developmental defiance*, which may be an intelligent rebellion against pressures that threaten personal integrity. Hostility, or an apparent antisocial attitude that accompanies this defiance, commonly subsides once the trait is sufficiently secured. (2) *Reactive defiance*, which is often interpreted as the manifestation of a morbid personality, but which may be a healthy reaction against unjust treatment. The conviction or statement, for example, that a specific type of treatment "shouldn't happen to a dog" often characterizes such an attitude. (3) *Defiance as a defense against an imagined threat*, which constitutes a possibly pathological symptom. When a child has a temper tantrum before entering school, it may signify fear of entering a group situation. Defiance of this nature does not arise from disrespect, or disobedience, and the child may eventually require psychiatric evaluation. (4) *The defiant ego*, the origin of which also appears to be psychopathological. Such a form of defiance is demonstrated by impulsive and apparently conscienceless destructive behavior. This attitude may represent either an absence of moral consideration or some mental mechanism that suppresses expression of normal attitudes.

Preventive measures

Redl mentions also the collective suspicion and negativism that exists between "the world of grownups" and "the youth of our times." Thus, an individual is often identified as a symbol of "those adults" or of "the way post-war young people behave." This confusion engenders conscious or unconscious collective counter-aggression and distrust. Redl therefore advises parents who worry about the conduct of their children to avoid a premature theoretical appraisal. Moreover, he cautions against misleading comparisons with "other people's cases." Only when behavior is viewed in the broadest perspective does its significance become evident.

Theories of etiology of juvenile delinquency postulated by recent psychiatric investigators do not cite parental permissiveness as an exclusive cause. Such an explanation, moreover, often arises from the public need for an obvious reason for or an easy solution to a growing social problem. Some authorities caution that the recent barrage of criticism of parents as being *entirely* responsible for juvenile delinquency is unfounded. Actually such unduly critical attitude may be harmful since it frequently creates a parental mistrust of common sense. The concept of permissiveness may, however, enable the physician to discover the cause of juvenile delinquency by an

explanation other than heredity, bad companions, poor schools, or divorce. Moreover, when it becomes evident that the parents provide the initial stimulus for delinquent behavior the physician may be able to help them attain the necessary and remedial insight into mental hygiene. In other words, parental love may not be enough, and should be supplemented by an understanding of the child. Certain cases may obviously require the authority of the courts to refer the parents to psychiatric therapy. There is, in this respect, a general agreement on the need for close cooperation among various disciplines. However, the physician, by an interview with the parents and the delinquent child, may help prevent court action and also prevent prolonged or serious personality disorders.

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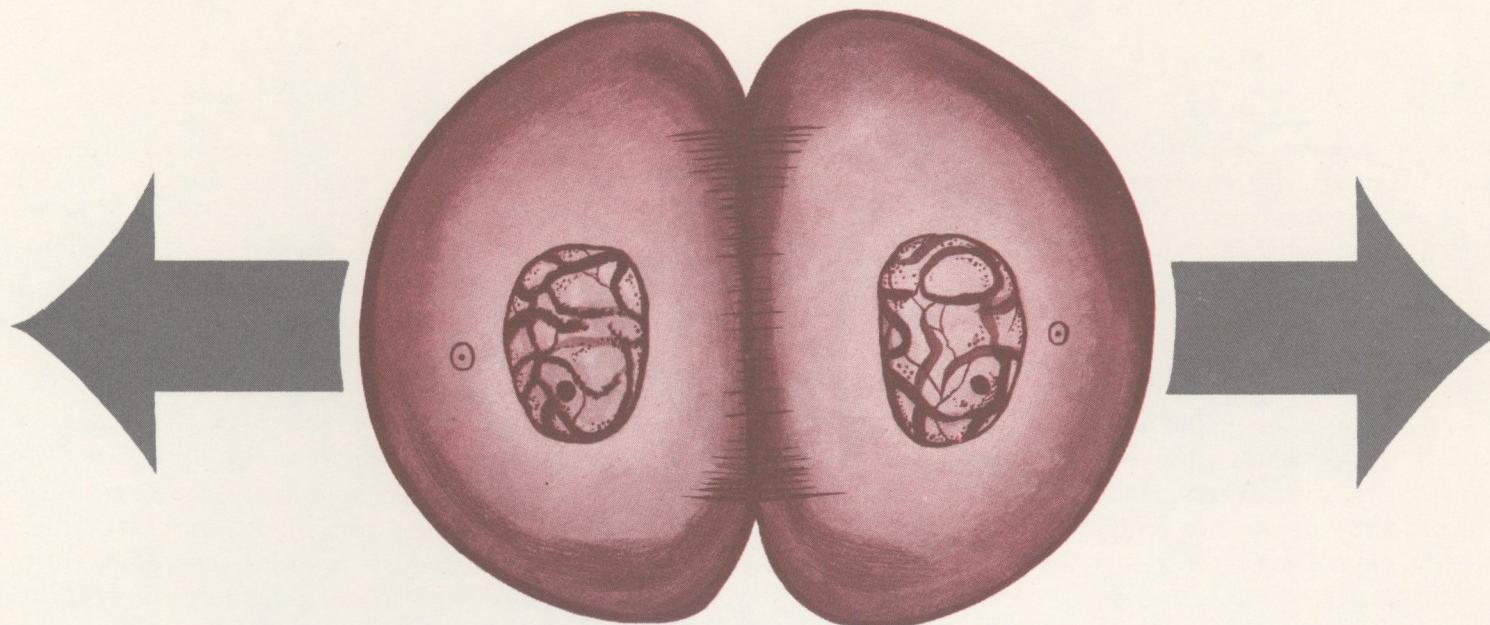
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Biologic Aspects of Schizophrenia

● THE CONCEPT that biological factors are fundamental to many of the psychoses may be found in the works of Freud, Jelgersma and Kraepelin, and thus is as old as psychiatry itself. This aspect of psychiatric research has been intensified. Now, in a brief period, many studies of the genetics, pharmacology and metabolism of schizophrenic patients have been instigated and the results are strongly suggestive that schizophrenia may be a psychosomatic disease of the central nervous system. A consideration of some of these investigations may serve to explain the tremendous enthusiasm with which they have been received by many clinicians.

Genetic factors

The accuracy of genetic studies of mental disease was discredited severely by the uncritical earlier analyses of several large family groups such as the Juke and Kallikak families. Recent studies by Kallmann, Slater and others have confirmed that genetic studies can be scientific and accurate. It has been proved conclusively that in the offspring of schizophrenic index patients the incidence of the disorder is over 19 times that in non-schizophrenic families, and that in some instances it may be 80 times the expected rate. The incidence of schizophrenia in the children

of schizophrenic parents is about ten per cent. Of 517 dizygotic co-twins studied by Kallmann, when one was schizophrenic, the other was also in ten per cent of cases. In contrast, in 174 monozygotic twins, this incidence was 69 per cent. In 41 pairs of monozygotic twins studied by Slater, only one twin was schizophrenic in each of 13 pairs, while both were affected in the other 28 pairs, or 76 per cent. His studies of dizygotic twins showed a concordance of only 14 per cent, in excellent agreement with Kallmann. From a consideration of these data, it has been proposed that the capacity to respond to stimuli with a schizophrenic reaction is dependent upon a specific recessive and autosomal genetic factor.

Metabolic aspects

Most of the earlier studies on metabolic disorders in schizophrenia were endocrinological, and the investigators attempted to show the presence of thyroid, pituitary or adrenal endocrinopathy in schizophrenic patients. Arieti has reviewed these investigations, and concluded that in many instances, the function of the endocrine system is definitely diminished. This altered function is believed to be mediated through the autonomic nervous system, and to be psychosomatic in nature. From this

standpoint there is no apparent etiologic relationship. Some of these studies, however, may require further consideration. Pincus and Hoagland found that in schizophrenic patients the adrenal cortices were refractory to the action of ACTH, and that these patients were thus unable to respond adequately to stress. Adrenocortical extracts, but not ACTH, restored their physiologic responses to stress conditions to an essentially normal level. The subsequent results of similar studies with the drug-induced psychoses provide some basis for thinking that this aspect of adrenal function may represent at least one major etiologic factor. In addition, the psychotic reactions induced by ACTH and cortisone administration, and their possible relationship to naturally-occurring schizophrenia have elicited much interest.

Considerable attention has been directed toward oxidative and carbohydrate metabolism in schizophrenics. There is sufficient reason to believe that oxygen uptake is deficient in most patients, but the direct cause of this is unknown. With regard to carbohydrate metabolism, it seems well established that most patients have a normal fasting blood glucose level, although sustained hyperglycemia may be frequent in acute or

early stages of disease. According to Shattock, sustained hyperglycemia after *oral* glucose administration is also seen in many schizophrenic patients who manifest a normal intravenous glucose tolerance test. Although many other biochemical parameters have been measured in schizophrenics, there have been few significant findings besides the wide range of values for any given variable.

Most promising of recent studies are those concerned with the neuro-endocrine substance, *serotonin*. Serotonin is formed in the body by the conversion of the essential amino acid, tryptophan, to 5-hydroxytryptophan, and thence through the action of the enzyme, 5-hydroxytryptophan decarboxylase, to serotonin. The latter substance is formed in high concentration in sympathetic ganglia, in some parts of the brain, and in a few other tissues, but is stored in a bound form, and functions as it is slowly released, presumably as a neurohumor. It exhibits an adrenergic effect 25 to 35 times that of adrenaline. After release into the circulation, it is rapidly metabolized and excreted as 5-hydroxyindole acetic acid. Much of the present evidence with regard to the crucial role of serotonin in mental disease has been gained from pharmacodynamic studies.

Pharmacologic evidence

The tranquilizing effect of the *Rauwolfia* alkaloids, and especially

reserpine, has been the object of intensive study. Careful investigation has shown that the sedative effect of reserpine is caused by the release of serotonin from its binding sites in various tissues, and that the release of serotonin from tissues is promoted by only those *Rauwolfia* alkaloids that are pharmacologically active. The *Rauwolfia* alkaloids have, in common with serotonin, the structural distinction of an indole nucleus. This same chemical distinction is shared by two other drugs that have recently been investigated in psychiatric research, lysergic acid diethylamide (LSD-25®) and mescaline. The latter compounds produce at low dosage levels in normal individuals a *model* psychosis which is in most respects indistinguishable from clinical schizophrenia. In some cases they may produce an electroencephalographic pattern similar to that seen in schizophrenia, which can be prevented or reversed, by Frenquel®, a non-hypnotic tranquilizing drug.

A combination of the observed structural relationships between the newly discovered pharmacologic agents and their pharmacodynamic and clinical effects has resulted in a strong conviction on the part of many authorities that a metabolic defect is definitely involved in schizophrenia. The antagonism of drugs to normal metabolites in specific enzyme systems frequently may produce the same symptoms as an idiopathic disease process. Woolley and

Shaw have suggested, therefore, that the model psychosis produced by mescaline and LSD may be the result of an enzymatic block which produces a serotonin deficiency, and that schizophrenia may be visualized as a metabolic disorder in which such a deficiency is produced by pathologic processes rather than by drugs. In contradistinction, however, Marrazzi and Hart have reasoned that it is more likely that *excess* serotonin causes mental disorders, through the creation in susceptible cerebral neural junctions of an imbalance between adrenergic inhibition and cholinergic excitation. The tremendous research effort directed toward resolution of these various viewpoints may help clarify in the immediate future the interrelationship between these metabolic aspects of cerebral function and the etiology of schizophrenia.

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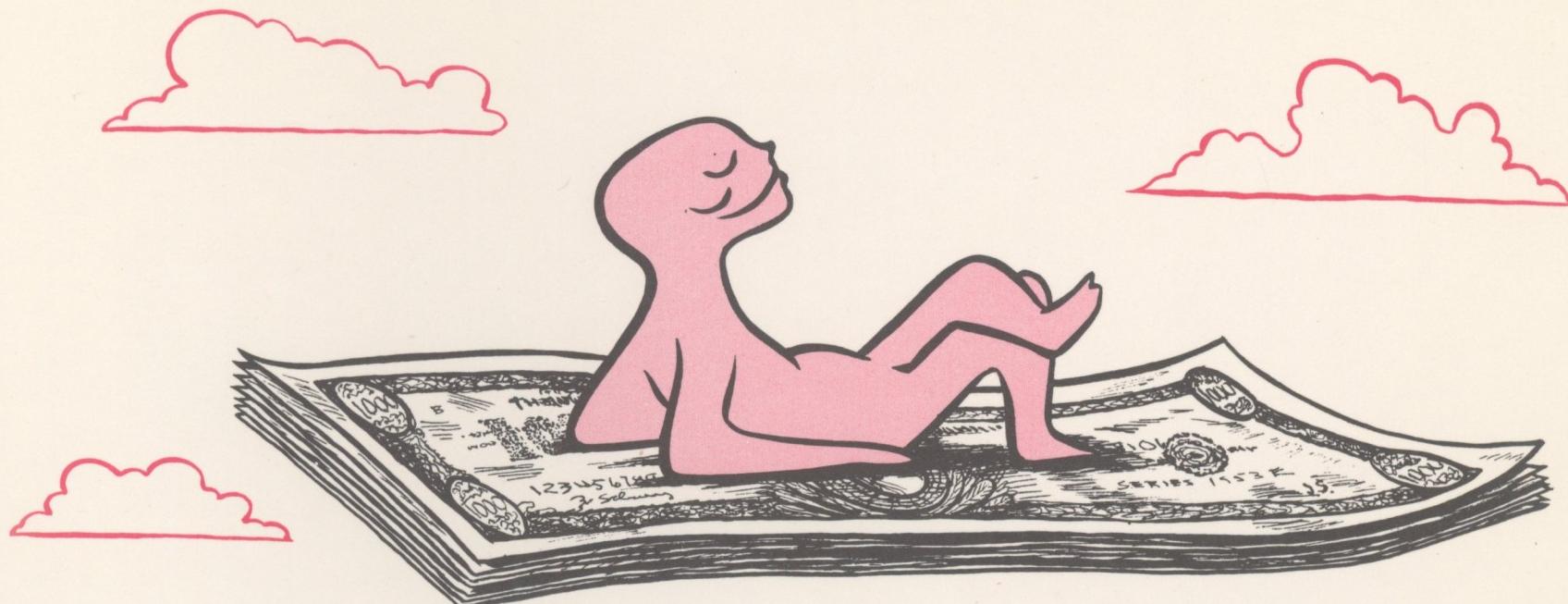
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FUNDS for MENTAL HEALTH

Almost from the beginning of American history, philanthropists and philanthropic foundations have made grants to encourage education. During recent years, millions of dollars have been given to promote basic research, professional education and demonstration projects.

Thirty years ago, various foundations helped to establish demonstration clinics across the country as part of a mental health program. Residential treatment centers for emotionally disturbed children are a more recent trial project supported by foundations. On a national level, the initiative and funds of still another group were responsible for bringing together the three national mental health and psychiatric associations into a unified organization.

Foundation funds made available for research have speeded the evaluation of new types of psychotherapy, drug therapy, and group and environmental approaches to rehabilitation. Other aspects of mental health which are being advanced by these efforts include our knowledge of the cause of mental illness and improvements in research and professional training.

Public awareness of the larger foundations is increasing through recognition of the national and world-wide programs. There are, however, many lesser known endowments and revolving funds administered by families, trust officers and universities. Each of these endowments and foundations is important to the total mental health program in extending the facilities of this field. Through such support, these philanthropic groups are also helping establish for American foundations their reputation for pioneering philanthropy in mental health work.

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"In the same way that the strength of the mind surpasses that of the body, the sufferings of the mind are more severe than the pains of the body."

—Cicero, *Orationes Philippicae*, XI,
circa 60 B.C.